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NASA Procedural Requirements

COMPLIANCE IS MANDATORY**NPR 7120.5E**Effective Date: August 14,
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Request Notification of Change (NASA Only)

Subject: NASA Space Flight Program and Project Management Requirements w/Changes 1-15

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Appendix A. Definitions

Acquisition. The process for obtaining the systems, research, services, construction, and supplies that NASA needs to fulfill its missions. Acquisition--which may include procurement (contracting for products and services)--begins with an idea or proposal that aligns with the NASA Strategic Plan and fulfills an identified need and ends with the completion of the program or project or the final disposition of the product or service.

Acquisition Plan. The integrated acquisition strategy that enables a program or project to meet its mission objectives and provides the best value to NASA. (See a description in Section 3.4 of the Program Plan and Project Plan templates, appendices G and H.)

Acquisition Strategy Meeting. A forum where senior Agency management reviews major acquisitions in programs and projects before authorizing significant budget expenditures. The ASM is held at the Mission Directorate/Mission Support Office level, implementing the decisions that flow out of the earlier Agency acquisition strategy planning. The ASM is typically held early in Formulation, but the timing is determined by the Mission Directorate. The ASM focuses on considerations such as impacting the Agency workforce, maintaining core capabilities and make-or-buy planning, and supporting Center assignments and potential partners.

Agency Baseline Commitment. Establishes and documents an integrated set of project requirements, cost, schedule, technical content, and an agreed-to JCL that forms the basis for NASA's commitment to the external entities of OMB and Congress. Only one official baseline exists for a NASA program or project, and it is the Agency Baseline Commitment.

Agency Program Management Council. The senior management group, chaired by the NASA Associate Administrator or designee that is responsible for reviewing Formulation performance, recommending approval, and overseeing implementation of programs and Category 1 projects according to Agency commitments, priorities, and policies.

Agreement. The statement (oral or written) of an exchange of promises. Parties to a binding agreement can be held accountable for its proper execution and a change to the agreement requires a mutual modification or amendment to the agreement or a new agreement.

Analysis of Alternatives. A formal analysis method that compares alternative approaches by estimating their ability to satisfy mission requirements through an effectiveness analysis and by estimating their life-cycle costs through cost analysis. The results of these two analyses are used together to produce a cost-effectiveness comparison that allows decision makers to assess the relative value or potential programmatic returns of the alternatives. An analysis of alternatives broadly examines multiple elements of program/project alternatives (including technical performance, risk, LCC, and programmatic aspects).

Announcement of Opportunity. An AO is one form of a NASA Broad Agency Announcement, which is a form of public/private competition. NASA solicits, accepts, and evaluates proposals submitted by all categories of proposers

in response to an AO, including academia, industry, not-for-profits, Government laboratories, Federally Funded Research and Development Centers (FFRDC), NASA Centers, and the Jet Propulsion Laboratory. Regulatory coverage of AOs appears in NASA Federal Acquisition Regulation (FAR) Supplement (NFS) Part 1872. NASA typically uses a one-step or a two-step AO process. In a one-step AO process, proposals for new projects are evaluated competitively and selected for Formulation in a single step. In two-step competitions, several proposals for new projects may be selected in Step 1 and given time to mature their concepts in a funded concept study before the Step 2 down-selection.

Approval. Authorization by a required management official to proceed with a proposed course of action. Approvals are documented.

Approval (for Implementation). Acknowledgment by the Decision Authority that the program /project has met stakeholder expectations and Formulation requirements and is ready to proceed to Implementation. By approving a program/project, the Decision Authority commits the budget resources necessary to continue into Implementation. Approval (for Implementation) is documented.

Assure. To promise or say with confidence. It is more about saying than doing. (An example is: I assure you that you will be warm enough.)

Architectural Control Document. A configuration-controlled document or series of documents that embodies a cross-Agency mission architecture(s), including the structure, relationships, interfaces, principles, assumptions, and results of the analysis of alternatives that govern the design and implementation of the enabling mission systems.

Baseline (document context). Implies the expectation of a finished product, though updates may be needed as circumstances warrant. All approvals required by Center policies and procedures have been obtained.

Baseline (general context). An agreed-to set of requirements, cost, schedule, designs, documents, etc., that will have changes controlled through a formal approval and monitoring process.

Baseline Performance Review. A monthly Agency-level independent assessment to inform senior leadership of performance and progress toward the Agency's mission and program/project performance. The monthly meeting encompasses a review of crosscutting mission support issues and all NASA mission areas.

Baseline Science Requirements. The mission performance requirements necessary to achieve the full science objectives of the mission. (Also see Threshold Science Requirements.)

Basis of Estimate. The documentation of the ground rules, assumptions, and drivers used in developing the cost and schedule estimates, including applicable model inputs, rationale or justification for analogies, and details supporting cost and schedule estimates. The basis of estimate is contained in material available to the SRB and management as part of the LCR and KDP process.

Budget. A financial plan that provides a formal estimate of future revenues and obligations for a definite period of time for approved programs, projects, and activities. (See NPR 9420.1 and NPR 9470.1 for other related financial management terms and definitions.)

Center Management Council. The council at a Center that performs oversight of programs and projects by evaluating all program and project work executed at that Center.

Change Request. A change to a prescribed requirement set forth in an Agency or Center document intended for all programs and projects for all time.

Compliance Matrix. The Compliance Matrix (Appendix C) documents whether and how the program or project complies with the requirements of NPR 7120.5. It provides rationale and approvals for waivers from requirements and is part of retrievable program and project records.

Component Facilities. Complexes that are geographically separated from the NASA Center or institution to which they are assigned, but are still part of the Agency.

Concept Documentation (formerly Mission Concept Report). Documentation that captures and communicates a feasible concept that meets the goals and objectives of the mission, including results of analyses of alternative concepts, the concept of operations, preliminary risks, and potential descopes. It may include images, tabular data, graphs, and other descriptive material.

Concurrence. A documented agreement by a management official that a proposed course of action is acceptable.

Confidence Level. A probabilistic assessment of the level of confidence of achieving a specific goal.

Configuration Management. A management discipline applied over a product's life cycle to provide visibility into and control changes to performance, functionality, and physical characteristics.

Conflict of Interest. A conflict of interest involves the abuse of "actual, apparent, or potential" of the trust that NASA has in its personnel. A conflict of interest is a situation in which financial or other personal considerations have

the potential to compromise or bias professional judgment and objectivity. An apparent conflict of interest is one in which a reasonable person would think that the individual's judgment is likely to be compromised. A potential conflict of interest involves a situation that may develop into an actual conflict of interest. A conflict of interest exists whether or not decisions are affected by a personal interest; a conflict of interest implies only the potential for bias, not likelihood.

Continuous Risk Management. A systematic and iterative process that efficiently identifies, analyzes, plans, tracks, controls, communicates, and documents risks associated with implementation of designs, plans, and processes.

Contract. A mutually binding legal relationship obligating the seller to furnish the supplies or services (including construction) and the buyer to pay for them. It includes all types of commitments that obligate the Government to an expenditure of appropriated funds and that, except as otherwise authorized, are in writing. In addition to bilateral instruments, contracts include (but are not limited to) awards and notices of awards; job orders or task letters issued under basic ordering agreements; letter contracts; orders, such as purchase orders, under which the contract becomes effective by written acceptance or performance; and bilateral contract modifications. Contracts do not include grants and cooperative agreements.

Contract Performance Report. Consists of five formats containing data for measuring contractors' cost and schedule performance on Government acquisition contracts. This is a contract data requirement when EVM is required.

Convening Authority. The management official(s) responsible for convening a program/project review; establishing the Terms of Reference, including review objectives and success criteria; appointing the SRB chair; and concurring in SRB membership. These officials receive the documented results of the review.

Cost Analysis Data Requirement. A formal document designed to help managers understand the cost and cost risk of space flight projects. The Cost Analysis Data Requirement (CADRe) consists of a Part A "Narrative" and a Part B "Technical Data" in tabular form, both provided by the program/project or Cost Analysis Division. Also, the project team produces the project life-cycle cost estimate, schedule, and risk identification, which is appended as Part C.

Decision Authority (program and project context). The individual authorized by the Agency to make important decisions on programs and projects under their authority.

Decision Memorandum. The document that summarizes the decisions made at KDPs or as necessary in between KDPs. The decision memorandum includes the Agency Baseline Commitment (if applicable), Management Agreement cost and schedule, UFE, and schedule margin managed above the project, as well as life-cycle cost and schedule estimates, as required.

Decommissioning. The process of ending an operating mission and the attendant project as a result of a planned end of the mission or project termination. Decommissioning includes final delivery of any remaining project deliverables, disposal of the spacecraft and all its various supporting systems, closeout of contracts and financial obligations, and archiving of project/mission operational and scientific data and artifacts. Decommissioning does not mean that scientific data analysis ceases, only that the project will no longer provide the resources for continued research and analysis.

Derived Requirements. Requirements arising from constraints, consideration of issues implied but not explicitly stated in the high-level direction provided by NASA Headquarters and Center institutional requirements, factors introduced by the selected architecture, and the design. These requirements are finalized through requirements analysis as part of the overall systems engineering process and become part of the program/project requirements baseline. Derived non-technical requirements are established by, and are the responsibility of, the Programmatic Authority. Derived technical requirements are the responsibility of the Institutional Authority.

Design Documentation. A document or series of documents that captures and communicates to others the specific technical aspects of a design. It may include images, tabular data, graphs, and other descriptive material. Design documentation is different from the CADRe, though parts of design documentation may be repeated in the latter.

Development Costs. The total of all costs from the period beginning with the approval to proceed to Implementation at the beginning of Phase C through operational readiness at the end of Phase D.

Deviation. A documented authorization releasing a program or project from meeting a requirement before the requirement is put under configuration control at the level the requirement will be implemented.

Disposal. The process of eliminating a project's assets, including the spacecraft and ground systems. Disposal includes the reorbiting, deorbiting, and/or passivation (i.e., the process of removing stored energy from a space structure at the end of mission that could result in an explosion or deflagration of the space structure) of a spacecraft.

Dissenting Opinion. A disagreement with a decision or action that is based on a sound rationale (not on unyielding opposition) that an individual judges is of sufficient importance that it warrants a specific review and decision by

higher-level management, and the individual specifically requests that the dissent be recorded and resolved by the Dissenting Opinion process.

Earned Value Management. A tool for measuring and assessing project performance through the integration of technical scope with schedule and cost objectives during the execution of the project. EVM provides quantification of technical progress, enabling management to gain insight into project status and project completion costs and schedules. Two essential characteristics of successful EVM are EVM system data integrity and carefully targeted monthly EVM data analyses (e.g., identification of risky WBS elements).

Earned Value Management System. An integrated management system and its related subsystems that allow for planning all work scope to completion; assignment of authority and responsibility at the work performance level; integration of the cost, schedule, and technical aspects of the work into a detailed baseline plan; objective measurement of progress (earned value) at the work performance level; accumulation and assignment of actual costs; analysis of variances from plans; summarization and reporting of performance data to higher levels of management for action; forecast of achievement of milestones and completion of events; forecast of final costs; and disciplined baseline maintenance and incorporation of baseline revisions in a timely manner.

Engineering Requirements. Requirements defined to achieve programmatic requirements and relating to the application of engineering principles, applied science, or industrial techniques.

Environmental Impact. The direct, indirect, or cumulative beneficial or adverse effect of an action on the environment.

Ensure. To do or have what is necessary for success. (An example is: I ensure that you will be warm enough.)

Environmental Management. The activity of ensuring that program and project actions and decisions that may potentially affect or damage the environment are assessed during the Formulation Phase and reevaluated throughout Implementation. This activity is performed according to all NASA policy and Federal, State, Tribal government and local environmental laws and regulations.

Evaluation. The continual self- and independent assessment of the performance of a program or project and incorporation of the evaluation findings to ensure adequacy of planning and execution according to plans.

Final (document context). Implies the expectation of a finished product. All approvals required by Center policies and procedures have been obtained.

Formulation. The identification of how the program or project supports the Agency's strategic goals; the assessment of feasibility, technology, and concepts; risk assessment, team building, development of operations concepts, and acquisition strategies; establishment of high-level requirements and success criteria; the preparation of plans, budgets, and schedules essential to the success of a program or project; and the establishment of control systems to ensure performance to those plans and alignment with current Agency strategies.

Formulation Agreement. The Formulation Agreement is prepared by the project to establish the technical and acquisition work that needs to be conducted during Formulation and defines the schedule and funding requirements during Phase A and Phase B for that work.

Formulation Authorization Document. The document issued by the MDAA to authorize the formulation of a program whose goals will fulfill part of the Agency's Strategic Plan and Mission Directorate strategies and establish the expectations and constraints for activity in the Formulation Phase. In addition, a FAD or equivalent is used to authorize the formulation of a project. (See Appendix E.)

Funding (budget authority). The authority provided by law to incur financial obligations that will result in expenditures. There are four basic forms of budget authority, but only two are applicable to NASA: appropriations and spending authority from offsetting collections (reimbursables and working capital funds). Budget authority is provided or delegated to programs and projects through the Agency's funds distribution process.

Health and Medical Requirements. Requirements defined by the Office of the Chief Health and Medical Officer.

Highly Specialized Information Technology. Highly specialized Information Technology (IT) is a part of, internal to, or embedded in a mission platform. The platform's function (e.g., avionics, guidance, navigation, flight controls, simulation, radar, etc.) is enabled by IT but not driven by IT itself (e.g., computer hardware and software to automate internal functions of a spacecraft or spacecraft support system such as spacecraft control and status, sensor signal and data processing, and operational tasking). Representative examples of highly specialized IT include: avionics software, real-time control systems, onboard processors, the Deep Space Network, spacecraft instrumentation software, wind tunnel control system, human physiology monitoring systems, ground support environment, experiment simulators, Mission Control Centers, and launch cameras. (For the complete definition, see NPR 7120.7, NASA Information Technology and Institutional Infrastructure Program and Project Management Requirements.)

Implementation. The execution of approved plans for the development and operation of the program/project, and the use of control systems to ensure performance to approved plans and continued alignment with the Agency's

goals.

Independent Assessment(s) (includes reviews, evaluations, audits, analysis oversight, investigations).

Assessments are independent to the extent the involved personnel apply their expertise impartially and without any conflict of interest or inappropriate interference or influence, particularly from the organization(s) being assessed.

Independent Funding (context of Technical Authority). The funding of Technical Authorities is considered independent if funding originating from the Mission Directorate or other Programmatic Authorities is provided to the Center in a manner that cannot be used to influence the technical independence or security of Technical Authorities.

Industrial Base. The capabilities residing in either the commercial or government sector required to design, develop, manufacture, launch, and service the program or project. This encompasses related manufacturing facilities, supply chain operations and management, a skilled workforce, launch infrastructure, research and development, and support services.

Information Technology. Any equipment or interconnected system(s) or subsystem(s) of equipment that is used in the automatic acquisition, storage, analysis, evaluation, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the Agency.

Infrastructure Requirements. The facilities and environmental, aircraft, personal property, equipment, and information technology resources that are needed to support programs and projects. Utilization of the capability afforded by the infrastructure includes consideration of the maintenance and other liabilities it presents.

Institutional Authority. Institutional Authority encompasses all those organizations and authorities not in the Programmatic Authority. This includes Engineering, Safety and Mission Assurance, and Health and Medical organizations; Mission Support organizations; and Center Directors.

Institutional Requirements. Requirements that focus on how NASA does business that are independent of the particular program or project. There are five types: Engineering, program/project management, safety and mission assurance, health and medical, and Mission Support Office functional requirements.

Integrated Baseline Review. A risk-based review conducted by Program/Project Management to ensure a mutual understanding between the customer and supplier of the risks inherent in the supplier's Performance Measurement Baseline (PMB) and to ensure that the PMB is realistic for accomplishing all of the authorized work within the authorized schedule and budget.

Integrated Center Management Council. The forum used by projects and programs that are being implemented by more than one Center and includes representatives from all participating Centers. The ICMC will be chaired by the director of the Center (or representative) responsible for program or project management.

Integrated Logistics Support. The management, engineering activities, analysis, and information management associated with design requirements definition, material procurement and distribution, maintenance, supply replacement, transportation, and disposal that are identified by space flight and ground systems supportability objectives.

Integrated Master Schedule. A logic network-based schedule that reflects the total project scope of work, traceable to the WBS, as discrete and measurable tasks/milestones and supporting elements that are time phased through the use of valid durations based on available or projected resources and well-defined interdependencies.

Integration Plan. The integration and verification strategies for a project interface with the system design and decomposition into the lower-level elements. The integration plan is structured to bring the elements together to assemble each subsystem and to bring all of the subsystems together to assemble the system/product. The primary purposes of the integration plan are: (1) to describe this coordinated integration effort that supports the implementation strategy, (2) to describe for the participants what needs to be done in each integration step, and (3) to identify the required resources and when and where they will be needed.

Interface Control Document. An agreement between two or more parties on how interrelated systems will interface with each other. It documents interfaces between things like electrical connectors (what type, how many pins, what signals will be on each of the pins, etc.); fluid connectors (type of connector or of fluid being passed, flow rates of the fluid, etc.); mechanical (types of fasteners, bolt patterns, etc.); and any other interfaces that might be involved.

Joint Cost and Schedule Confidence Level. (1) The probability that cost will be equal to or less than the targeted cost and schedule will be equal to or less than the targeted schedule date. (2) A process and product that helps inform management of the likelihood of a project's programmatic success. (3) A process that combines a project's cost, schedule, and risk into a complete picture. JCL is not a specific methodology (e.g., resource-loaded schedule) or a product from a specific tool. The JCL calculation includes consideration of the risk associated with all elements, regardless of whether or not they are funded from appropriations or managed outside of the project. JCL calculations include the period from KDP C through the hand over to operations, i.e., end of the on-orbit checkout.

Key Decision Point. The event at which the Decision Authority determines the readiness of a program/project to

progress to the next phase of the life cycle (or to the next KDP).

Knowledge Management. A collection of policies, processes, and practices relating to the use of intellectual and knowledge-based assets in an organization.

Learned Lesson. Captured knowledge or understanding gained through experience which, if shared, would benefit the work of others. Unlike a best practice, lessons learned describes a specific event that occurred and provides recommendations for obtaining a repeat of success or for avoiding reoccurrence of an adverse work practice or experience.

Life-Cycle Cost. The total of the direct, indirect, recurring, nonrecurring, and other related expenses both incurred and estimated to be incurred in the design, development, verification, production, deployment, prime mission operation, maintenance, support, and disposal of a project, including closeout, but not extended operations. The LCC of a project or system can also be defined as the total cost of ownership over the project or system's planned life cycle from Formulation (excluding Pre-Phase A) through Implementation (excluding extended operations). The LCC includes the cost of the launch vehicle.

Life-Cycle Review. A review of a program or project designed to provide a periodic assessment of the technical and programmatic status and health of a program or project at a key point in the life cycle, e.g., Preliminary Design Review (PDR) or Critical Design Review (CDR). Certain life-cycle reviews provide the basis for the Decision Authority to approve or disapprove the transition of a program/project at a KDP to the next life-cycle phase.

Loosely Coupled Programs. These programs address specific objectives through multiple space flight projects of varied scope. While each individual project has an assigned set of mission objectives, architectural and technological synergies and strategies that benefit the program as a whole are explored during the Formulation process. For instance, Mars orbiters designed for more than one Mars year in orbit are required to carry a communication system to support present and future landers.

Management Agreement. Within the Decision Memorandum, the parameters and authorities over which the program or project manager has management control constitute the program or project Management Agreement. A program or project manager has the authority to manage within the Management Agreement and is accountable for compliance with the terms of the agreement.

Margin. The allowances carried in budget, projected schedules, and technical performance parameters (e.g., weight, power, or memory) to account for uncertainties and risks. Margins are allocated in the formulation process, based on assessments of risks, and are typically consumed as the program/project proceeds through the life cycle.

Metric. A measurement taken over a period of time that communicates vital information about the status or performance of a system, process, or activity.

Mission. A major activity required to accomplish an Agency goal or to effectively pursue a scientific, technological, or engineering opportunity directly related to an Agency goal. Mission needs are independent of any particular system or technological solution.

Mission Directorate Program Management Council. The forum that evaluates all programs and projects executed within that Mission Directorate and provides input to the MDAA. For programs and Category 1 projects, the MDAA carries forward the MDPMC findings and recommendations to the APMC.

Mission Support Office Requirements. Requirements defined by Mission Support Offices (e.g., procurement and medical).

Non-Applicable Requirement. Any requirement not relevant; not capable of being applied.

Operations Concept (formerly Mission Operations Concept). A description of how the flight system and the ground system are used together to ensure that the concept of operation is reasonable. This might include how mission data of interest, such as engineering or scientific data, are captured, returned to Earth, processed, made available to users, and archived for future reference. The Operations Concept should describe how the flight system and ground system work together across mission phases for launch, cruise, critical activities, science observations, and end of mission to achieve the mission.

Orbital Debris. Any object placed in space by humans that remains in orbit and no longer serves any useful function. Objects range from spacecraft to spent launch vehicle stages to components and also include materials, trash, refuse, fragments, and other objects that are overtly or inadvertently cast off or generated.

Performance Measurement Baseline. The time-phased cost plan for accomplishing all authorized work scope in a project's life cycle, which includes both NASA internal costs and supplier costs. The project's performance against the PMB is measured using earned value management, if required, or other performance measurement techniques if EVM is not required. The PMB does not include UFE.

Preliminary (document context). Implies that the product has received initial review in accordance with Center

best practices. The content is considered correct, though some TBDs may remain. All approvals required by Center policies and procedures have been obtained. Major changes are expected.

Prescribed Requirement. A requirement levied on a lower organizational level by a higher organizational level.

Primary Risks. Those undesirable events having both high probability and high impact/severity.

Principal Investigator. A person who conceives an investigation and is responsible for carrying it out and reporting its results. In some cases, PIs from industry and academia act as project managers for smaller development efforts with NASA personnel providing oversight.

Procurement Strategy Meeting. A forum where management reviews and approves the approach for the Agency's major and other selected procurements. Chaired by the assistant administrator for Procurement (or designee), the Procurement Strategy Meeting (PSM) addresses and documents information, activities, and decisions required by the FAR and NFS and incorporates NASA strategic guidance and decisions from the ASM strategic acquisition meeting to ensure the alignment of the individual procurement action with NASA's portfolio and mission.

Program. A strategic investment by a Mission Directorate or Mission Support Office that has a defined architecture and/or technical approach, requirements, funding level, and management structure that initiates and directs one or more projects. A program implements a strategic direction that the Agency has identified as needed to accomplish Agency goals and objectives. (See Section 2.1.2.)

Program Commitment Agreement. The contract between the AA and the responsible MDAA that authorizes transition from Formulation to Implementation of a program. (See Appendix D.)

Program/Project Management Requirements. Requirements that focus on how NASA and Centers perform program and project management activities.

Program Plan. The document that establishes the program's baseline for Implementation, signed by the MDAA, Center Director(s), and program manager.

Program (Project) Team. All participants in program (project) Formulation and Implementation. This includes all direct reports and others that support meeting program (project) responsibilities.

Programmatic Authority. Programmatic Authority includes the Mission Directorates and their respective program and project managers. Individuals in these organizations are the official voices for their respective areas. Programmatic Authority sets, oversees, and ensures conformance to applicable programmatic requirements.

Programmatic Requirements. Requirements set by the Mission Directorate, program, project, and PI, if applicable. These include strategic scientific and exploration requirements, system performance requirements, safety requirements, and schedule, cost, and similar nontechnical constraints.

Project. A space flight project is a specific investment identified in a Program Plan having defined requirements, a life-cycle cost, a beginning, and an end. A project also has a management structure and may have interfaces to other projects, agencies, and international partners. A project yields new or revised products that directly address NASA's strategic goals.

Project Plan. The document that establishes the project's baseline for Implementation, signed by the responsible program manager, Center Director, project manager, and the MDAA, if required. (See Appendix H.)

Rebaselining. The process that results in a change to a project's Agency Baseline Commitment.

Reimbursable Program/Project. A project (including work, commodities, or services) for customers other than NASA for which reimbursable agreements have been signed by both the customer and NASA. The customer provides funding for the work performed on their behalf.

Replanning. The process by which a program or project updates or modifies its plans.

Request for Action/Review Item Discrepancy. The most common names for the comment forms that reviewers submit during life-cycle reviews that capture their comments, concerns, and/or issues about the product or documentation. Often, RIDs are used in a more formal way, requiring boards to disposition them and having to get agreements with the submitter, project, and board members for their disposition and closeout. RFAs are often treated more informally, almost as suggestions that may or may not be reacted to.

Reserves. Obsolete term. See Unallocated Future Expenses.

Residual Risk. The remaining risk that exists after all mitigation actions have been implemented or exhausted in accordance with the risk management process. (See NPD 8700.1.)

Risk. In the context of mission execution, risk is the potential for performance shortfalls, which may be realized in the future, with respect to achieving explicitly established and stated performance requirements. The performance shortfalls may be related to any one or more of the following mission execution domains: (1) safety, (2) technical, (3)

cost, and (4) schedule. (See NPR 8000.4, Agency Risk Management Procedural Requirements.)

Risk Assessment. An evaluation of a risk item that determines: (1) what can go wrong, (2) how likely is it to occur, (3) what the consequences are, (4) what the uncertainties are that are associated with the likelihood and consequences, and (5) what the mitigation plans are.

Risk Management. Risk management includes risk-informed decision making (RIDM) and continuous risk management (CRM) in an integrated framework. RIDM informs systems engineering decisions through better use of risk and uncertainty information in selecting alternatives and establishing baseline requirements. CRM manages risks over the course of the development and the Implementation Phase of the life cycle to ensure that safety, technical, cost, and schedule requirements are met. This is done to foster proactive risk management, to better inform decision making through better use of risk information, and then to more effectively manage Implementation risks by focusing the CRM process on the baseline performance requirements emerging from the RIDM process. (See NPR 8000.4, Agency Risk Management Procedural Requirements.) These processes are applied at a level of rigor commensurate with the complexity, cost, and criticality of the program.

Risk-Informed Decision Making. A risk-informed decision-making process uses a diverse set of performance measures (some of which are model-based risk metrics) along with other considerations within a deliberative process to inform decision making.

Safety. Freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.

Safety and Mission Assurance Requirements. Requirements defined by the SMA organization related to safety and mission assurance.

Security. Protection of people, property, and information assets owned by NASA that covers physical assets, personnel, IT, communications, and operations.

Signature. A distinctive mark, characteristic, or thing that indicates identity; one's name as written by oneself.

Single-Project Programs. These programs tend to have long development and/or operational lifetimes, represent a large investment of Agency resources, and have contributions from multiple organizations/agencies. These programs frequently combine program and project management approaches, which they document through tailoring.

Stakeholder. An individual or organizational customer having an interest (or stake) in the outcome or deliverable of a program or project.

Standards. Formal documents that establish a norm, requirement, or basis for comparison, a reference point to measure or evaluate against. A technical standard, for example, establishes uniform engineering or technical criteria, methods, processes, and practices. (Refer to NPR 7120.10, Technical Standards for NASA Programs and Projects.)

Standing Review Board. The board responsible for conducting independent reviews (life cycle and special) of a program/project and providing objective, expert judgments to the convening authorities. The reviews are conducted in accordance with approved Terms of Reference (ToR) and life-cycle requirements per this document and NPR 7123.1.

Success Criteria. That portion of the top-level requirements that defines what is to be achieved to successfully satisfy NASA Strategic Plan objectives addressed by the program or project.

Suppliers. Each project office is a customer having a unique, multi-tiered hierarchy of suppliers to provide it products and services. A supplier may be a contractor, grantee, another NASA Center, university, international partner, or other government agency. Each project supplier is also a customer if it has authorized work to a supplier lower in the hierarchy.

Supply Chain. The specific group of suppliers and their interrelationships that is necessary to design, develop, manufacture, launch, and service the program or project. This encompasses all levels within a space system, including providers of raw materials, components, subsystems, systems, systems integrators, and services.

System. The combination of elements that function together to produce the capability required to meet a need. The elements include all hardware, software, equipment, facilities, personnel, processes, and procedures needed for this purpose.

Systems Engineering. A disciplined approach for the definition, implementation, integration, and operation of a system (product or service). The emphasis is on achieving stakeholder functional, physical, and operational performance requirements in the intended use environments over planned life within cost and schedule constraints. Systems engineering includes the engineering processes and technical management processes that consider the interface relationships across all elements of the system, other systems, or as a part of a larger system.

Tailoring. The process used to adjust or seek relief from a prescribed requirement to accommodate the needs of a

specific task or activity (e.g., program or project). The tailoring process results in the generation of deviations and waivers depending on the timing of the request.

Technical Authority. Part of NASA's system of checks and balances that provides independent oversight of programs and projects in support of safety and mission success through the selection of individuals at delegated levels of authority. These individuals are the Technical Authorities. Technical Authority delegations are formal and traceable to the Administrator. Individuals with Technical Authority are funded independently of a program or project.

Technical Authority Requirements. Requirements invoked by OCE, OSMA, and Office of the Chief Health and Medical Officer (OCHMO) documents (e.g., NPRs or technical standards cited as program or project requirements) or contained in Center institutional documents. These requirements are the responsibility of the office or organization that established the requirement unless delegated elsewhere.

Technical Standard. Common and repeated use of rules, conditions, guidelines, or characteristics for products or related processes and production methods and related management systems practices; the definition of terms, classification of components; delineation of procedures; specification of dimensions, materials, performance, designs, or operations; measurement of quality and quantity in describing materials, processes, products, systems, services, or practices; test methods and sampling procedures; or descriptions of fit and measurements of size or strength. (Source: OMB Circular No. A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities.) (See NPR 7120.10, Technical Standards for NASA Programs and Projects.)

Technology Readiness Level. Provides a scale against which to measure the maturity of a technology. TRLs range from 1, Basic Technology Research, to 9, Systems Test, Launch, and Operations. Typically, a TRL of 6 (i.e., technology demonstrated in a relevant environment) is required for a technology to be integrated into a flight system. (See Systems Engineering Handbook NASA/SP-2007-6105 Rev 1, p. 296 for more information on TRL levels and technology assessment.)

Termination Review. A review initiated by the Decision Authority for the purpose of securing a recommendation as to whether to continue or terminate a program or project. Failing to stay within the parameters or levels specified in controlling documents will result in consideration of a termination review.

Terms of Reference. A document specifying the nature, scope, schedule, and ground rules for an independent review or independent assessment.

Threshold Science Requirements. The mission performance requirements necessary to achieve the minimum science acceptable for the investment. In some AOs used for competed missions, threshold science requirements may be called the "science floor" for the mission. (Also see Baseline Science Requirements.)

Tightly Coupled Programs. Programs with multiple projects that execute portions of a mission(s). No single project is capable of implementing a complete mission. Typically, multiple NASA Centers contribute to the program. Individual projects may be managed at different Centers. The program may also include other agency or international partner contributions.

Unallocated Future Expenses. The portion of estimated cost required to meet specified confidence level that cannot yet be allocated to the specific project WBS sub-elements because the estimate includes probabilistic risks and specific needs that are not known until these risks are realized.

Uncoupled Programs. Programs implemented under a broad theme and/or a common program implementation concept, such as providing frequent flight opportunities for cost-capped projects selected through AO or NASA Research Announcements. Each such project is independent of the other projects within the program.

Validation. The process of showing proof that the product accomplishes the intended purpose based on stakeholder expectations. May be determined by a combination of test, analysis, demonstration, and inspection. (Answers the question, "Am I building the right product?")

Verification. Proof of compliance with requirements. Verification may be determined by a combination of test, analysis, demonstration, and inspection. (Answers the question, "Did I build the product right?")

Waiver. A documented authorization releasing a program or project from meeting a requirement after the requirement is put under configuration control at the level the requirement will be implemented.

Work Breakdown Structure. A product-oriented hierarchical division of the hardware, software, services, and data required to produce the program's or project's end product(s), structured according to the way the work will be performed and reflecting the way in which program/project costs and schedule, technical, and risk data are to be accumulated, summarized, and reported.

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